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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/809,957

03/25/2004

Edward T. Grochowski

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7887

8791

7590

11/21/2006

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EXAMINER

LI, AIMEE J

ART UNIT

PAPER NUMBER

2183

DATE MAILED: 11/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/809,957		GROCHOWSKI, EDWARD T.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Aimee J. Li		2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 August 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date _____                                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Claims 1-43 have been considered. Claim 34 has been amended as per Applicant's request.

#### *Papers Submitted*

2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment as filed 28 August 2006.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-12, 15-22, and 36-43 are rejected under 35 U.S.C. 102(b) as being taught by Dirk Grunwald, Artur Klauser, Srilatha Manne, and Andrew Pleszkun's "Confidence Estimation for Speculation Control" IEEE ©1998 (herein referred to as Grunwald).

5. Referring to claim 1, Grunwald has taught an apparatus, comprising:

- a. A first circuit to store a global confidence history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraph 1; and Figure 2);
- b. A second circuit to store a global prediction value history (Grunwald Section 3.1, paragraphs 1 and 4; Section 3.3; Section, 3.3.1, paragraphs 1 and 5; and Figure 2);
- c. A first index function to produce a first index signal from said global confidence history (Grunwald Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and

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4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2); and

- d. A first pattern history table to retrieve a value responsive to said first index signal (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

6. Referring to claims 15 and 36, taking claim 15 as exemplary, Grunwald has taught a method, comprising:

- a. Creating a first index using a global confidence history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraph 1; and Figure 2); and
- b. Applying said first index to a pattern history table to retrieve a value (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

7. Claim 36 has similar limitations to claim 15 and is rejected for similar reasons.

8. Referring to claims 2, 16, and 37, taking claim 2 as exemplary, Grunwald has taught the apparatus of claim 1, wherein said first index function to use an instruction pointer signal (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claims 16 and 23 have similar limitations to claim 2 and are rejected for the same reasons.

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9. Referring to claims 3, 17, and 38, Grunwald has taught, taking claim 3 as exemplary, the apparatus of claim 2, wherein said first index function to use said global prediction value history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claims 17 and 38 have similar limitations to claim 3 and are rejected for the same reasons.

10. Referring to claims 4, 18, and 39, Grunwald has taught, taking claim 4 as exemplary, the apparatus of claim 1, wherein said first pattern history table to store a confidence count (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claims 18 and 39 have similar limitations to claim 4 and are rejected for the same reasons.

11. Referring to claim 5, Grunwald has taught, taking claim 5 as exemplary, the apparatus of claim 4, wherein said confidence count to increment subsequent to a correct prediction (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

12. Referring to claim 6, Grunwald has taught the apparatus of claim 4, wherein said confidence count to decrement on an incorrect prediction (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

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13. Referring to claims 7, 22, and 43, taking claim 7 as exemplary, Grunwald has taught the apparatus of claim 4, wherein said confidence count to clear on an incorrect prediction (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claims 22 and 43 have similar limitations and are rejected for the same reasons.

14. Referring to claim 8, Grunwald has taught the apparatus of claim 4, wherein said confidence count to form a confidence value signal by utilizing a threshold (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

15. Referring to claims 9, 21, and 42, taking claim 9 as exemplary, Grunwald has taught the apparatus of claim 7, wherein said confidence value signal to update said global confidence history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claims 21 and 42 have similar limitations to claim 7 and are rejected for the same reasons.

16. Referring to claim 10, Grunwald has taught the apparatus of claim 7, further comprising a second pattern history table to retrieve a predicted value (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

17. Referring to claim 11, Grunwald has taught the apparatus of claim 10, wherein said confidence value signal to mask said predicted value (Grunwald Section Abstract; Section 1,

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paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

18. Referring to claim 12, Grunwald has taught the apparatus of claim 11, wherein said apparatus to issue a predicted value signal including combinations predicted true and confident, predicted false and confident, and not confident (Grunwald Section 3.3.1, paragraphs 1-5).

19. Referring to claims 19 and 40, taking claim 19 as exemplary, Grunwald has taught the method of claim 18, further comprising comparing said confidence count to a threshold. (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claim 40 has similar limitations to claim 19 and is rejected for the same reasons.

20. Referring to claims 20 and 41, taking claim 20 as exemplary, Grunwald has taught the method of claim 19, further comprising issuing a confidence value responsive to said comparing. (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claim 41 has similar limitations to claim 40 and is rejected for the same reasons.

### ***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dirk Grunwald, Artur Klauser, Srilatha Manne, and Andrew Pleszkun's "Confidence Estimation for Speculation Control" IEEE ©1998 (herein referred to as Grunwald) as applied to claim 1 respectively above, and further in view of McFarling et al., U.S. Patent Number 5,758,142 (herein referred to as McFarling). Grunwald has not taught

- a. The apparatus of claim 1, wherein said first circuit and said second circuit are speculative registers (Applicant's claim 13).
- b. The apparatus of claim 13, further comprising a third circuit to store an architectural global confidence history, and a fourth circuit to store an architectural global prediction value history, wherein said third circuit to update said first circuit and said fourth circuit to update said second circuit (Applicant's claim 14).

23. McFarling has taught

- a. The apparatus of claim 1, wherein said first circuit and said second circuit are speculative registers (Applicant's claim 13) (McFarling column 4, lines 13-14 and 30-35 and column 6, lines 7-8).
- b. The apparatus of claim 13, further comprising a third circuit to store an architectural global confidence history, and a fourth circuit to store an architectural global prediction value history, wherein said third circuit to update said first circuit and said fourth circuit to update said second circuit (Applicant's claim 14) (McFarling column 5, line 55 to column 6, line 64; column 10, lines 23-55; Figure 1; Figure 2; and Figure 9).



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24. A person of ordinary skill in the art at the time the invention was made, and as taught by McFarling, multiple branch predictor, like that of McFarling, provides better branch prediction (McFarling column 3, lines 30-31), thereby improving instruction scheduling and processing time (McFarling column 1, lines 36-49 and column 2, lines 5-10). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multiple branch predictors of McFarling in the device of Grunwald to improve instruction scheduling and processing time.

25. Claims 23-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dirk Grunwald, Artur Klauser, Srilatha Manne, and Andrew Pleszkun's "Confidence Estimation for Speculation Control" IEEE ©1998 (herein referred to as Grunwald) in view of Free On-Line Dictionary of Computing (herein referred to as FOLDOC).

26. Referring to claim 23, Grunwald has taught a system, comprising a processor including a first circuit to store a global confidence history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraph 1; and Figure 2), a first index function to produce a first index signal from said global confidence history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraph 1; and Figure 2), and a first pattern history table to retrieve a value responsive to said first index signal (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Grunwald has not taught

- a. An interface to couple said processor to an input/ output circuit; and

- b. An audio input/output circuit.

27. FOLDOC has taught

- a. An interface to couple said processor to an input/ output circuit (FOLDOC “computer” ©1995); and
- b. An audio input/output circuit (FOLDOC “audio” ©1999).

28. In regards to FOLDOC, “computer” has taught that “I/O devices allow the computer to communicate with the user and the outside world”, which includes audio that produces sound. A person of ordinary skill in the art at the time the invention was made, and as taught by FOLDOC, would have recognized that I/O circuits, which include audio, “allow the computer to communicate with the user and the outside world” (FOLDOC “computer” ©1995), thereby allowing the user and outside world to monitor the computer’s functions and results. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the I/O devices of FOLDOC in the device of Grunwald to allow the user and outside world to monitor the computer’s functions and results.

29. Referring to claim 24, Grunwald has taught the apparatus of claim 23, wherein said first index function to use an instruction pointer signal (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

30. Referring to claim 25, Grunwald has taught the apparatus of claim 24, wherein said first index function to use said global prediction value history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

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31. Referring to claim 26, Grunwald has taught the apparatus of claim 23, wherein said first pattern history table to store a confidence count (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). Claims 18 and 39 have similar limitations as claim 4 and are rejected for the same reasons.

32. Referring to claim 27, Grunwald has taught the apparatus of claim 26, wherein said confidence count to increment subsequent to a correct prediction (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

33. Referring to claim 28 Grunwald has taught the apparatus of claim 26, wherein said confidence count to clear on an incorrect prediction (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

34. Referring to claim 29, Grunwald has taught the apparatus of claim 26, wherein said confidence count to form a confidence value signal by utilizing a threshold (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

35. Referring to claim 30, Grunwald has taught the apparatus of claim 29, wherein said confidence value signal to update said global confidence history (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

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36. Referring to claim 31, Grunwald has taught the apparatus of claim 26, further comprising a second pattern history table to retrieve a predicted value (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2).

37. Referring to claim 32, Grunwald has taught the apparatus of claim 26, wherein said confidence value signal to mask said predicted value (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2). In regards to Grunwald, Grunwald has taught that the confidence value is used to determine whether to use a predicted value or not (Grunwald Section Abstract; Section 1, paragraphs 2-3; Section 3, paragraphs 2 and 4-5; Section 3.1, paragraphs 1 and 4; Section 3.2.1, paragraph 1; Section 3.3; Section 3.3.1, paragraphs 1 and 5; and Figure 2) and a “mask” in computer science is “A pattern of characters, bits, or bytes used to control the elimination or retention of another pattern of characters, bits, or bytes (www.dictionary.com “mask” ©2000).”

38. Referring to claim 33, Grunwald has taught the apparatus of claim 32, wherein said apparatus to issue a predicted value signal including combinations predicted true and confident, predicted false and confident, and not confident (Grunwald Section 3.3.1, paragraphs 1-5).

39. Claims 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dirk Grunwald, Artur Klauser, Srilatha Manne, and Andrew Pleszkun’s “Confidence Estimation for Speculation Control” IEEE ©1998 (herein referred to as Grunwald) in view of Free On-Line Dictionary of Computing (herein referred to as FOLDOC) as applied to claim 23 above, and

further in view of McFarling et al., U.S. Patent Number 5,758,142 (herein referred to as McFarling). Grunwald has not taught

- a. The apparatus of claim 23, wherein said first circuit is a speculative register (Applicant's claim 34).
- b. The apparatus of claim 34, further comprising a third circuit to store an architectural global confidence history, and a fourth circuit to store an architectural global prediction value history, wherein said third circuit to update said first circuit and said fourth circuit to update said second circuit (Applicant's claim 35).

40. McFarling has taught

- a. The apparatus of claim 23, wherein said first circuit is a speculative register (Applicant's claim 34) (McFarling column 4, lines 13-14 and 30-35 and column 6, lines 7-8).
- b. The apparatus of claim 34, further comprising a third circuit to store an architectural global confidence history, and a fourth circuit to store an architectural global prediction value history, wherein said third circuit to update said first circuit and said fourth circuit to update said second circuit (Applicant's claim 35) (McFarling column 5, line 55 to column 6, line 64; column 10, lines 23-55; Figure 1; Figure 2; and Figure 9).

41. A person of ordinary skill in the art at the time the invention was made, and as taught by McFarling, multiple branch predictor, like that of McFarling, provides better branch prediction (McFarling column 3, lines 30-31), thereby improving instruction scheduling and processing

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time (McFarling column 1, lines 36-49 and column 2, lines 5-10). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the multiple branch predictors of McFarling in the device of Grunwald to improve instruction scheduling and processing time.

*Response to Arguments*

42. Examiner withdraws objections to the drawings in favor of the replacement drawings.
43. Examiner withdraws objections to the specification in favor of the amended specification.
44. Examiner withdraws the rejection to claim 34 under 35 U.S.C. § 112, second paragraph, in favor of the amended claim 34.
45. Applicant's arguments filed 28 August 2006 have been fully considered but they are not persuasive.
46. Applicant's argue in essence on pages 11 and 12

Thus, Grunwald merely discloses the confidence estimator that has the index computed using the history of branch prediction. In contrast, claim...refers to a first circuit to store a global confidence history; and a first index function to produce a first index signal from the global confidence history.

47. This has not been found persuasive. As Grunwald describes on page 125, column 1, paragraph 2, the JRS Estimator method that uses a counter table (MDC table) that tracks the confidence of a branch prediction, similar to how a Gshare predictor operates. Grunwald teaches that, when a branch is resolved, the corresponding confidence counter is either incremented or the value is reset to zero. In essence, these confidence counters track whether past branch predictions were correct or not, i.e. a global confidence history. Also, Grunwald teaches that

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the confidence counters output a value that is compared to a threshold to determine whether the branch prediction has a high confidence or low confidence, i.e. an index is created. As can be seen in Grunwald's Figure 2, the branch prediction is output based upon whether the confidence is low or high.

48. Applicant's argue in essence on pages 12-14

...It would be impermissible hindsight, based on Applicant's own disclosure, to combine Grunwald and McFarling.

...

...It would be impermissible hindsight, base on Applicant's own disclosure, to combine Grunwald and FOLDLOC.

...

...It would be impermissible hindsight, based on Applicant's own disclosure, to combine Grunwald, McFarling, and FOLDLOC.

49. This has not been found persuasive. This has not been found persuasive. Grunwald discloses that the McFarling branch predictor was used on page 125, column 2, paragraph 1. McFarling et al., U.S. Patent Number 5,758,142 is the patent version of the McFarling paper referenced by the paper. Grunwald does not disclose the details of McFarling's branch prediction mechanism, however, McFarling's patent does disclose the details. A person of ordinary skill in the art at the time the invention was made would have recognized that the use of McFarling's branch predictor provides better branch prediction (McFarling column 3, lines 30-31), thereby improving instruction scheduling and processing time (McFarling column 1, lines 36-49 and column 2, lines 5-10). Grunwald discloses that its scheme is part of the improvements

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to modern processors, which are typically used in a computer type machine. FOLDOC teaches the details not disclosed in Grunwald with regards to other elements besides a processor, i.e. CPU, in a computer type machine. A person of ordinary skill in the art at the time the invention was made, and as taught by FOLDOC, would have recognized that I/O circuits, which include audio, "allow the computer to communicate with the user and the outside world" (FOLDOC "computer" ©1995), thereby allowing the user and outside world to monitor the computer's functions and results.

50. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

### ***Conclusion***

51. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

52. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37



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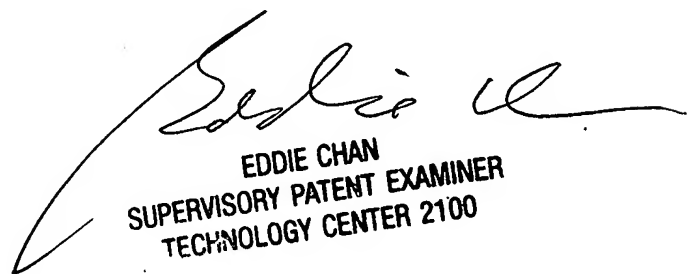
CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

53. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J. Li whose telephone number is (571) 272-4169. The examiner can normally be reached on M-T 7:30am-5:00pm.

54. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

55. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL  
Aimee J. Li  
08 November 2006



EDDIE CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100